

08/917,044 12/31/98

(FILE 'USPAT' ENTERED AT 08:14:55 ON 31 DEC 1998)

L1 16 S (220/62.12/CCLS OR 202/62.13/CCLS) AND (POLYETHYLENE OR
PE)
L2 3 S (220/62.12/CCLS OR 202/62.13/CCLS) AND (PCR OR RECYCL?)
L3 103448 S RECYCL? OR PCR
L4 82448 S POLYETHYLENE AND POLYPROPYLENE
L5 16831 S POLYPROPYLENE (P) (INNER? OR INTERIOR OR CONTACT?)
L6 1410 S L3 AND L5
L7 61 S POST CONSUMER RECYCL?
L8 5 S L7 AND L6
L9 5 S L5 AND L7
L10 10926 S L5 AND L4
L11 66 S L10 AND 428/517/CCLS
L12 2 S L11 AND 428/903.3/CCLS
L13 7 S L10 AND 220/62.12/CCLS
E 3947617/UREF
L14 1 S E3

FILE 'EPO, JPO' ENTERED AT 08:51:00 ON 31 DEC 1998

FILE 'EPO'

L15 11 S L7
FILE 'JPO'
L16 0 S L7
TOTAL FOR ALL FILES
L17 11 S L7
FILE 'EPO'
L18 232 S L10
FILE 'JPO'
L19 687 S L10
TOTAL FOR ALL FILES
L20 919 S L10
FILE 'EPO'
L21 540 S (MIGRAT? OR CONTAMINAT?) AND RECYCL?
FILE 'JPO'
L22 113 S (MIGRAT? OR CONTAMINAT?) AND RECYCL?
TOTAL FOR ALL FILES
L23 653 S (MIGRAT? OR CONTAMINAT?) AND RECYCL?
FILE 'EPO'
L24 2 S L20 AND L23
FILE 'JPO'
L25 0 S L20 AND L23
TOTAL FOR ALL FILES
L26 2 S L20 AND L23

FILE 'USPAT' ENTERED AT 08:58:22 ON 31 DEC 1998

L27 368 S L26
L28 368 S L20 AND L23
L29 368 FOCUS L28 1-
E 4646925/UREF
L30 23 S E3
L31 114 S 220/62.13/CCLS
L32 0 S L31 AND L7
L33 2 S L31 AND L3
E 4982872/UREF
L34 6 S E3
L35 0 S 220/62.22/CCLS AND L7
L36 15 S 220/62.22/CCLS AND L3
L37 5 S L36 AND L10

L38 19226 S POLYETHYLENE (P) (EXTERIOR OR OUTER?)
L39 3625 S L10 AND L38
L40 1241126 S BARRIER OR PREVENT? OR MIGRAT?
L41 2923 S L39 AND L40
L42 61379 S L40 (P) (CONTAMIN? OR RECYCL?)
L43 391 S L39 AND L42
L44 391 FOCUS L43 1-
L45 4 S L43 AND (PCR OR POST CONSUMER RECYCL?)
L46 0 S RECYCLED POLYETHYLENE
L47 143 S RECYCLED POLYETHYLENE

US PAT NO: 3,947,617 [IMAGE AVAILABLE] L13: 4 of 7
 US-CL-CURRENT: 220/62.12, 62.13; 427/447; 428/35.8, 418

DETDESC:

DETD(8)

Particular . . . having the characteristics described above, include thermoplastic epoxide and phenoxide resins having molecular weights of about 20,000 to about 200,000, **polypropylene**, nylon, **polyethylene** and the like. Thermoplastic epoxide resins adhered to container substrates as a continuous, blister-free film are particularly uncommon. Because of . . . for containers for the reasons set forth herein and for other reasons have not been derived from a solvent based **polypropylene** or nylon system. Furthermore, the solvent of such systems has a great affinity for the polymer which results in the. . .

DETDESC:

DETD(9)

Containers having on their **interior** thin, adherent films of nylon, polybutylene, ethylene-maleic acid copolymers, or **polypropylene** which are solvent-free, blister-free and possess a thin, uniform thickness have not heretofore been made. **Polypropylene** has some limitation as an **interior** coating for food and beverage cans as it tends to absorb flavor; however, it can be used as a coating. . . competitive with thicker films of less expensive resins. It has not been possible previously to form nylon films on the **interior** of containers from a powdered nylon resin in film thicknesses of 0.5 mils and less.

:ab

metal substrate

US PAT NO: 3,947,617 [IMAGE AVAILABLE] L13: 4 of 7

ABSTRACT:

A small-mouthed container having a continuous resinous coating covering the interior of said container and end, said interior coating having a thickness less than about 1 mil and being free of low molecular weight organic matter, is disclosed herein. Typical containers are food and beverage containers having cylindrical metal walls and circular disc-shaped ends. The coating is typically a comestible coating having a thickness of less than 1 mil and having no occluded solvent therein. Thermoset resinous coatings are particularly useful. A coating is applied by flowing a mixture of gas and fine resin particles through a nozzle into the vicinity of a plasma arc flame which at least partially melts the surface of said particles and propels said particles into a rapidly spinning container having one closed end. A predetermined quantity of resin is pulsed through the nozzle to deposit on the interior of the container a uniform coating of resin particles. A cured coating can be obtained by introducing the particles into a plasma flame for a sufficient residence time to liquify substantially said particles and to impart sufficient energy therein that said particles cure upon said substrate without subsequent addition of energy. Alternatively, the container coated with uncured particles can be heated in a curing oven for a period and at a temperature sufficient to produce a cured resinous coating.

US PAT NO: 5,407,629 [IMAGE AVAILABLE]

L8: 3 of 5

SUMMARY:

BSUM(2)

The . . . in a corrugated paper box, is lighter in weight and less expensive to manufacture, but it is not reusable or **recyclable** and is susceptible to leakage if dropped. Although it has been suggested to provide a plastic container with a separately. . .

SUMMARY:

BSUM(4)

In . . . a plurality of layers. The container is economical to manufacture, light in weight, easy to handle, can be made of **recyclable** materials, and is "product efficient" in that substantially all of the product can be dispensed from the container during use.

DETDESC:

DETD(5)

FIG. . . . finish 26 and neck flange 23. The preform 20 has multiple layers, which as shown in FIGS. 3-4, include an **innermost** layer 36, an **inner** boundary layer 37, a core layer 38, an outer boundary layer 39, and an outermost layer 40, in serial relation from the **inner** to the outer surfaces of the preform. In this preferred five-layer structure, the **innermost** and outermost layers 36 and 40 are of substantially equal thickness and are formed of the same thermoplastic material, preferably polyethylene terephthalate (PET). The central core layer 38 is substantially twice the thickness of the **innermost** and outermost layers and is also formed of PET. The **inner** and outer boundary layers 37 and 39 are substantially thinner and are made of a different material having little if. . . adjacent layers 36, 38 and 40. A preferred boundary material is ethylene vinyl alcohol (EVOH). Other suitable materials include polyethylene, **polypropylene**, nylon (MXD-6), etc.

DETDESC:

DETD(6)

The . . . the layers 36 and 40, so as to complete the construction of the preform 20. Other core materials such as **post-consumer (recycled)** PET may be utilized as well.

DETDESC:

DETD(14)

The container may be made from a variety of materials, limited only by the requirement that the **inner** layer (which may include more than one layer) be readily separable from the next **inner** layer. Thus, the **innermost**, core and outermost layers 36, 38 and 40 may be made of any

first thermoplastic resin, such as the polymers typically used in the packaging industry, i.e., polyethylene terephthalate (PET), **polypropylene**, polyethylene, polyvinyl chloride, polycarbonate and mixtures thereof. The boundary layers 37 and 39 are made of a material which is . . . alcohol (PVOH), nylon (e.g., MXD-6 sold by Mitsubishi Corporation, New York, N.Y.), and mixtures thereof. A particularly preferred container has **innermost**, core and outermost layers of PET and thin boundary layers of EVOH.

08/917,044 12/31/98

not available as
prior art

US PAT NO: 5,524,787 [IMAGE AVAILABLE]
US-CL-CURRENT: 220/62.22; 215/12.1, 398; 220/771

L37: 2 of 5

SUMMARY:

BSUM(2)

This . . . handle. The composite containers are comprised of at least two components which may be separated after use, for ease of **recycling**. An inner container is a lightweight plastic bottle, and an outer layer is a sleeve which provides some structural support. . .

SUMMARY:

BSUM(6)

CA . . . aimed at providing a container for safely storing chemical reagents, especially those reagents which attack glass. The patent describes a **polyethylene** bottle having ribs or lugs molded on the outer surface of the bottle side wall, and a substantially rigid band.

SUMMARY:

BSUM(8)

U.S. Pat. No. 4,782,945, published on 8th Nov. 1988, provides a plastic bottle and carrier assembly adapted to facilitate **recycling**. The bottle carriers described in this patent are intended to be reusable, whereas the bottles themselves can be **recycled**.

SUMMARY:

BSUM(13)

It is a further objective of the present invention to provide a composite container which may be readily **recycled**. In order to achieve this, the inner part of the container is made from a lightweight plastic, which is given. . .

DETDESC:

DETD(10)

Any suitable thermoplastic material may be used to make the **inner** container, however preferred materials include **polyethylene**, **polypropylene**, polyester, polyvinylchloride, **polyethylene** terephthalate, **polyethylene** terephthalate with glycol additive or mixtures thereof. The container may be made partly or fully out of **recycled** plastic materials. Furthermore the **inner** container may be laminated in more than one layer. However it is preferred that the container is transparent or semitransparent. . .

DETDESC:

DETD(14)

The . . . plastic sleeve has the advantage that there is no need to separate the components of the composite container prior to

recycling.

DETDESC:

DETD(15)

In . . . Although many variations will be apparent to the man skilled in the art, the preferred method is stretch-wrapping of a **polyethylene** sleeve.
:2 leg

US PAT NO:	5,524,787 [IMAGE AVAILABLE]	L37: 2 of 5
DATE ISSUED:	Jun. 11, 1996	
TITLE:	Lightweight, composite container	
INVENTOR:	Alan D. Blake, Overijse, Belgium Andre M. G. Jacobs, Zemst, Belgium Annick A. S. Van Put, Brasschaat, Belgium	
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